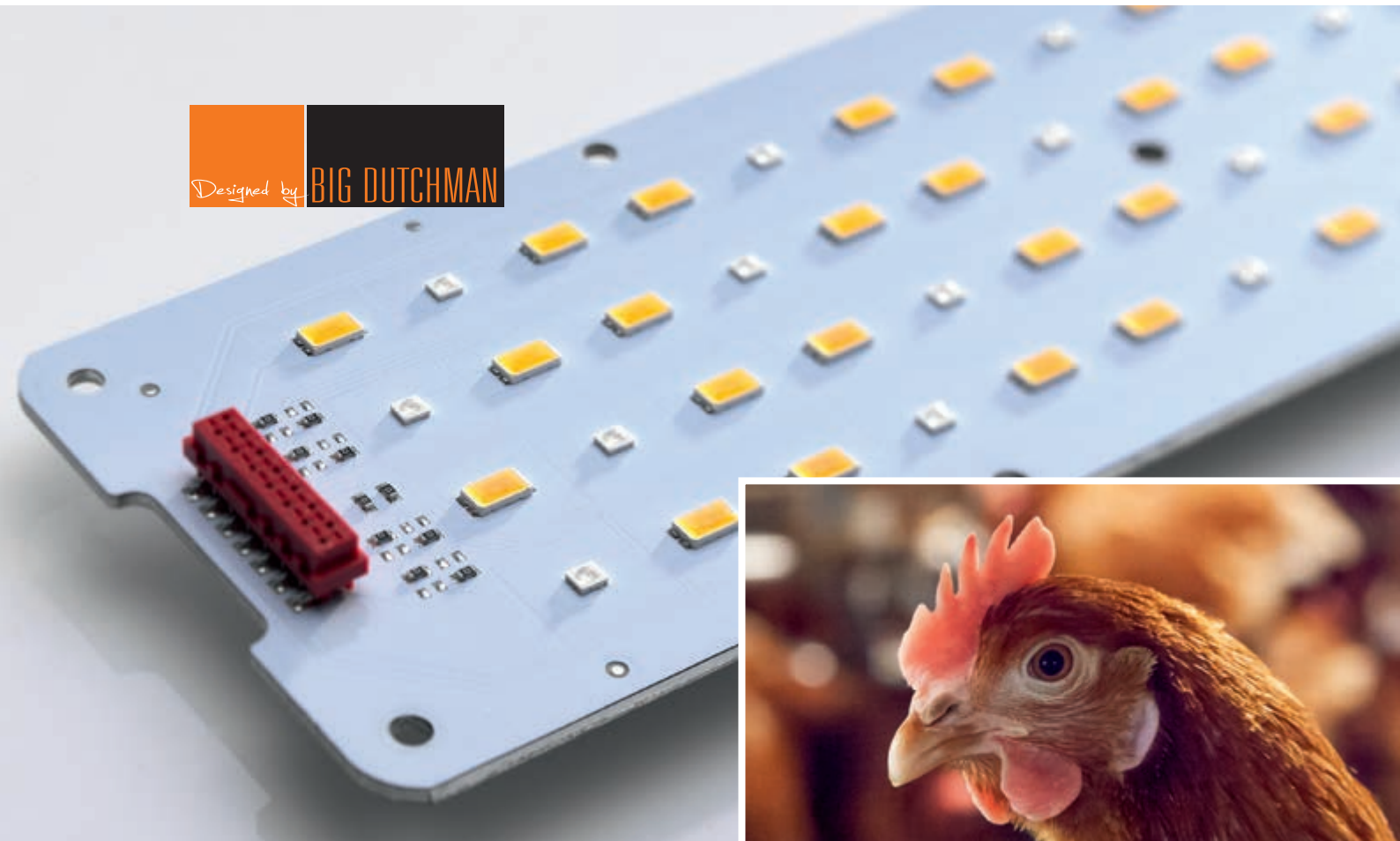




Big Dutchman®

Designed by **BIG DUTCHMAN**



LED lighting

Efficient and durable LED solutions for your poultry house

LED lamps for the ideal lighting concept

LED lamps designed by Big Dutchman are of a high quality and have been developed specifically to meet your needs and the conditions in poultry houses. We differentiate between lighting inside the system and the illumination of the barn.

Our extensive product range includes the following options:

- FlexLED (several customised versions)
- ZeusLED (several customised versions)
- Moisture-proof LED lamp

- HELIOS
- Light control 103

Let our experts advise you to find the best solution for your individual requirements.

BD LED

Very energy-saving, high quality, proven a million times over

Due to the many advantages of LED lamps, LEDs (light-emitting diodes) are state-of-the-art technology used today in poultry production. Big Dutchman recognised this trend early on and has developed LEDs for the specific requirements of animal husbandry. Lighting in poultry houses not only must withstand the conditions in the barn, but also be able to meet the birds' needs, or more specifically, their eyes' needs. We started replacing the standard light bulbs with LED bulbs in 2011. This replacement was mainly triggered by the energy-saving

potential of LED lamps. Together with the control unit developed by Big Dutchman, we

were able to provide farmers with a great alternative to conventional light bulbs.

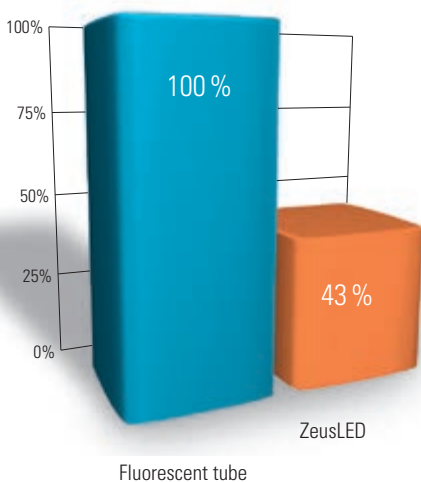


The trend continued at a high pace: in 2014, we introduced the very successful tube lamp FlexLED to the market. Only a year later, we added the ZeusLED ceiling lamp to our product range, which was just as successful. Both Big Dutchman innovations perfectly meet the requirements in poultry houses. We vouch for this declaration and only offer the best quality, including a three-year warranty for FlexLED, ZeusLED and HELIOS.

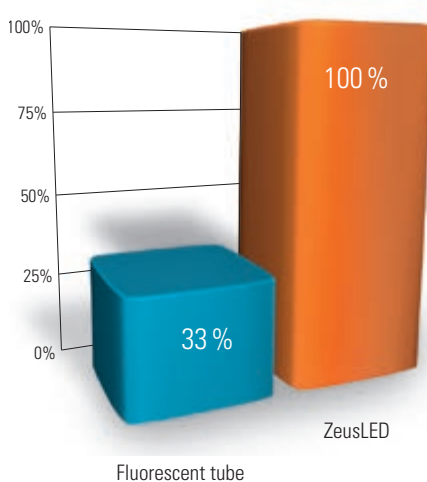
This means:

- ✓ use of brand LEDs (Osram) and other brand components;
- ✓ a series number (QR code) on each lamp or component to ensure full traceability;
- ✓ certified ammonia resistance and protection rating;
- ✓ functional testing of each lamp including tolerance measuring.

Comparison of energy costs



Comparison of the service life



Big Dutchman test centre

For our customers' benefit

Our internal test centre is equipped with a special environmental test chamber. In this chamber, we can expose our LED lamps to extreme temperatures ranging from -40 °C to +180 °C. The humidity can also be adjusted:

from 0 to 100 percent. The tests give us and you the security of knowing that our LED lamps work just as well in Siberia as they do in the desert. By exposing the LED lamps to very high temperatures over a longer time, we

can simulate the ageing process. This allows us to make reliable statements regarding the lamps' actual service life.



Environmental test chamber



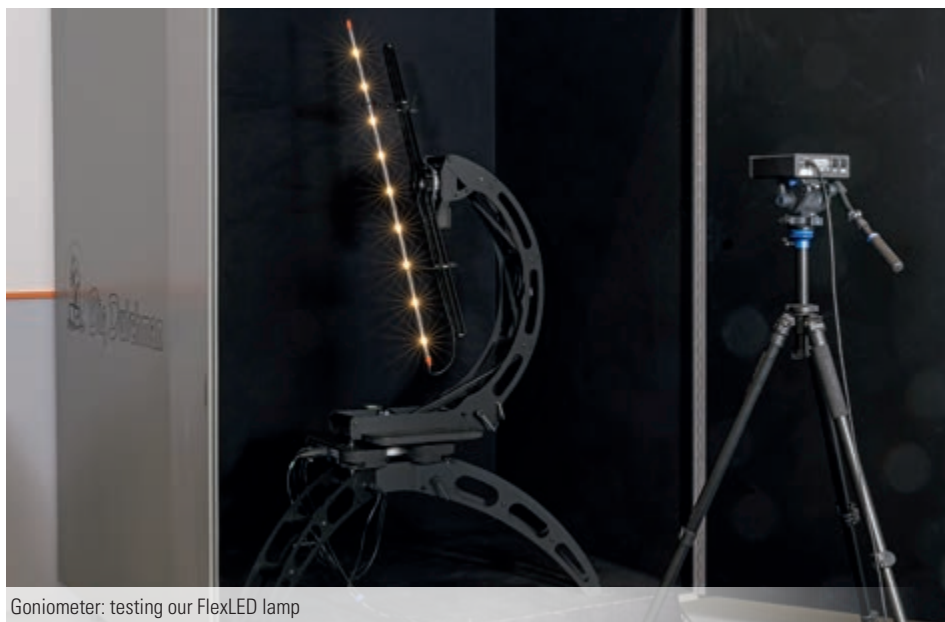
ZeusLED ceiling lamp, tested under temperatures of -25 °C



Use of an infrared camera

Big Dutchman has invested in a special measuring instrument, a goniometer, to be able to carry out specific calculations regarding lighting parameters. Using this goniometer, we can determine beam angles, the optical spectrum, the colour temperature and many other characteristics of our different LED lamps. The corresponding values are recorded in a data sheet. We prepare a DIALux report to determine the ideal type, number and position of LED lamps individually for each barn. The tool also makes 3D drawings available.

If the customer is planning to apply for subsidies, such a test report is a sure way of proving the possible energy savings.



Goniometer: testing our FlexLED lamp



Preparation of the perfect lighting concept for your needs

Together with you and directly on site, we will define the ideal lighting concept for your barn. The only information we need are your house dimensions and the required lux value. The software promptly calculates how many lamps must be installed at which location. We can also compare the different LED lamps. This comparison is free of charge and guarantees that only the number of LED lamps that is actually required will be installed.

FlexLED

Flexible tube lamp



BIG DUTCHMAN FLEXLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6816

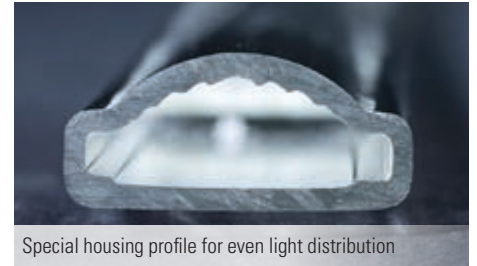


Use of FlexLED to light the litter area below a layer aviary

FlexLED is an innovative LED tube lamp which can be used very flexibly. Be it aviaries or enriched colony systems, there are nearly no boundaries for FlexLED. The main cable runs through the entire house (outside of the bird

area) without any plug connections and thus ensures that the entire power remains in the main line. Retrofitting additional FlexLED tube lamps at a later point is also very simple. Thanks to the plug & play principle, each LED

tube can be installed individually in any place. In addition, all connections are completely waterproof.



Special housing profile for even light distribution



Use of FlexLED in a rearing house

Main advantages

- ✓ low power consumption;
- ✓ resistant to high-pressure cleaning, IP 69K;
- ✓ 0 to 100 % dimmable;
- ✓ even light distribution;
- ✓ zero flickering even at low light intensities;
- ✓ 2-channel lamp (warm white / red);
- ✓ certified by the German Agricultural Society (DLG, test report 6816);
- ✓ 48 V DC safety extra-low voltage;
- ✓ plug & play installation for quick, easy and flexible mounting;
- ✓ use of brand LEDs (Osram);
- ✓ continuous main cable prevents contact resistance caused by plug-in connections;
- ✓ good price : performance ratio;
- ✓ available in different lengths;
- ✓ three-year warranty.

FlexLED HO

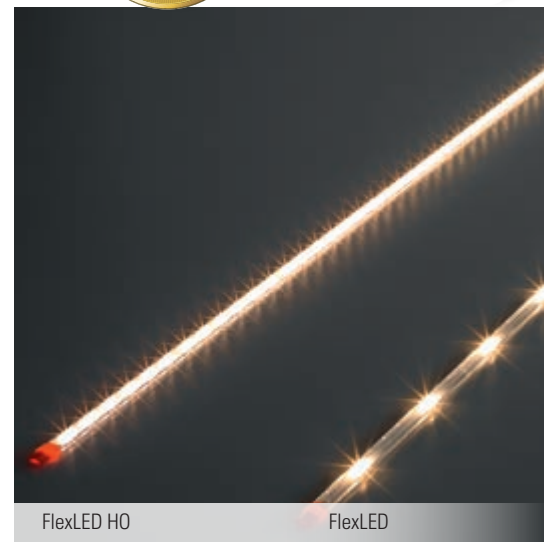
Efficient and economic illumination of ceilings and aisles



BIG DUTCHMAN FLEXLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6816



Use of FlexLED HO in a broiler house



FlexLED HO

FlexLED

FlexLED HO (high output) is another innovative and very flexible LED tube lamp. FlexLED HO is equipped with four times as many LEDs as FlexLED, with the corresponding increased light output. FlexLED HO is also wired without plugs. At the continuous main cable, FlexLED HO lamps can be connected wherever

necessary. Furthermore, it is easily possible to retrofit the lamp at a later point.

FlexLED HO has the following additional advantages:

- ✓ only a quarter of lamps required compared to the standard FlexLED lamp;
- ✓ optimised light distribution, especially in

barns with low ceilings;

- ✓ very low installation costs;
- ✓ costs savings of up to 40 percent compared to FlexLED, depending on the area of use.

FlexLED 2-channel

Patent pending!

The new FlexLED 2-channel lamp is based on the well-proven FlexLED tube lamp. FlexLED 2-channel allows farmers to switch between warm white and red light or mixed light. This

switch requires the same two-core ribbon cable that was already used in the past. Red light can be helpful to prevent feather pecking or cannibalism, especially when

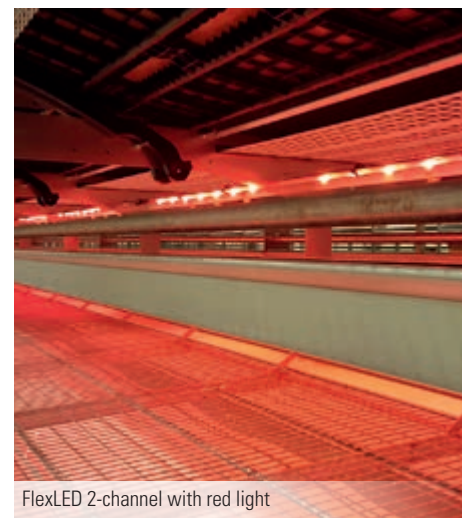
keeping layers in aviary systems. All advantages listed for our FlexLED tube lamp also apply to the FlexLED 2-channel lamp.



FlexLED 2-channel with warm white light



FlexLED 2-channel with red / white light



FlexLED 2-channel with red light

FlexLED bulb

Flexible 360° aisle lighting

FlexLED bulb is the ideal lamp to replace your conventional light bulbs. Not only is it 0 to 100 percent dimmable and has a service life of 50,000 hours, the lamp is also installed in the same manner as all our other FlexLED lamps. Despite low installation requirements, FlexLED bulb is incredible versatile. A special feature is the lamp's housing, which is made of a heat-conducting plastic material. This material ensures perfect cooling of the LED lamp.

FlexLED bulb has the following advantages:

- ✓ very efficient at 103 lm/W;

- ✓ resistant to a high number of chemicals;
- ✓ resistant to high temperatures;
- ✓ resistant to shocks;
- ✓ very low weight;
- ✓ very fast installation because the lamp is easy to suspend;
- ✓ compatible with all other FlexLED lamps;
- ✓ resistant to high-pressure cleaning, IP 69K protection rating.



BIG DUTCHMAN FLEXLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6816



FlexLED bulb: perfect aisle lighting

FlexLED eco

Compact LED lamp with an attractive price : performance ratio



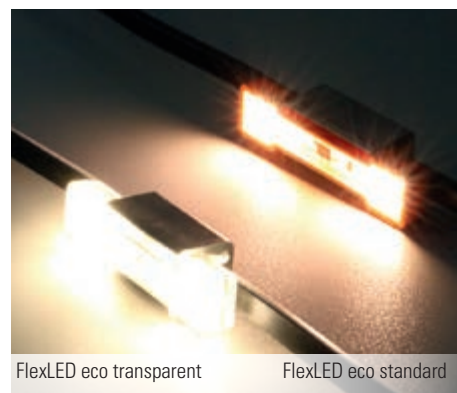
Use of FlexLED eco in a rearing house

FlexLED eco is a small LED lamp whose output is similar to that of a 25-watt bulb. In addition to the standard version, we can also offer a transparent option. FlexLED eco standard produces a directed light beam, perfect to illuminate a feed pan, for example. The light from FlexLED eco transparent is dispersed in all directions, making this lamp the ideal lighting solution for the area below the aviary. The installation process is the same as with the other FlexLED lamps.

FlexLED eco has the following additional advantages:

- ✓ can easily be retrofitted into any existing system;

- ✓ very little space required;
- ✓ attractive price : performance ratio.



FlexLED eco transparent

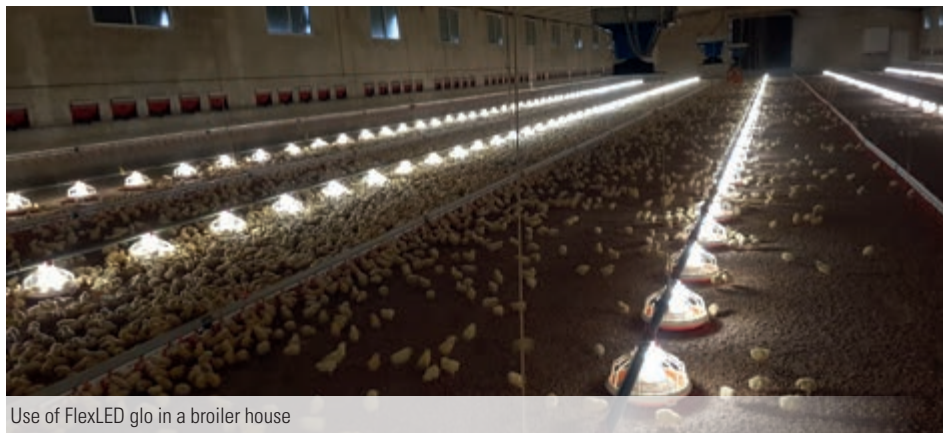
FlexLED eco standard

FlexLED glo

The LED lamp inside the feed pan

FlexLED glo is a very small LED lamp that is installed in the central cylinder of the feed pan. The installation process is the same as with our other FlexLED lamps.

FlexLED glo makes it easier for broilers to find feed, especially for the chicks during the first few days in the barn. This ensures an ideal start for the chicks and sometimes even makes the use of chick paper unnecessary.



Use of FlexLED glo in a broiler house



BIG DUTCHMAN ZEUSLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6815

ZeusLED

Professional LED ceiling lamp

A customised lighting concept significantly contributes to the success of your farm. The innovative ceiling lamp ZeusLED evenly illuminates all areas of a poultry house. Big Dutchman offers ZeusLED as a 1- or 2-channel

lamp: an exclusive brand product of the highest quality. ZeusLED can be used for multiple purposes thanks to the LED technology and a wide optical spectrum. Energy savings of up to 50 percent compared

to conventional moisture-proof lamps are an unbeatable advantage.



Cool white light



Warm white light



Red light

The moisture-proof lamp ZeusLED is available with different LED boards as an option. These boards can be exchanged on site without a service technician, even after installation is complete.

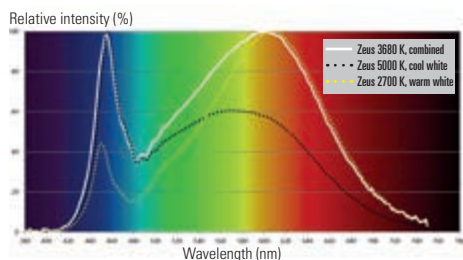
Different combinations of luminous colours are possible: warm white and cool white/red/blue/UV.



Use of ZeusLED in an aviary house



Use of ZeusLED in a broiler house



Light spectrum



Installation directly at the sandwich panel



Many different installation options

Main advantages

- ✓ great energy savings;
- ✓ DLG certification (test report 6815);
- ✓ zero flickering even at low light intensities;
- ✓ wide optical spectrum from warm white to cool white, infinitely variable;
- ✓ 2-channel lamp, e.g. to simulate sunrise and sunset;
- ✓ modular design consisting of a power supply unit, an LED driver and LED lamps;
- ✓ rugged aluminium housing with an exterior heat sink for optimum cooling up to an ambient temperature of +50 °C;
- ✓ use of different optics (depending on the application) for ideal and efficient lighting;
- ✓ long service life, low maintenance requirements;
- ✓ resistant to high-pressure cleaning, IP 69K;
- ✓ can be installed at walls, ceilings and sandwich panels or mounted to tubes.



BIG DUTCHMAN ZEUSLED
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6815

ZeusLED Batwing

Lots of light, small investment!

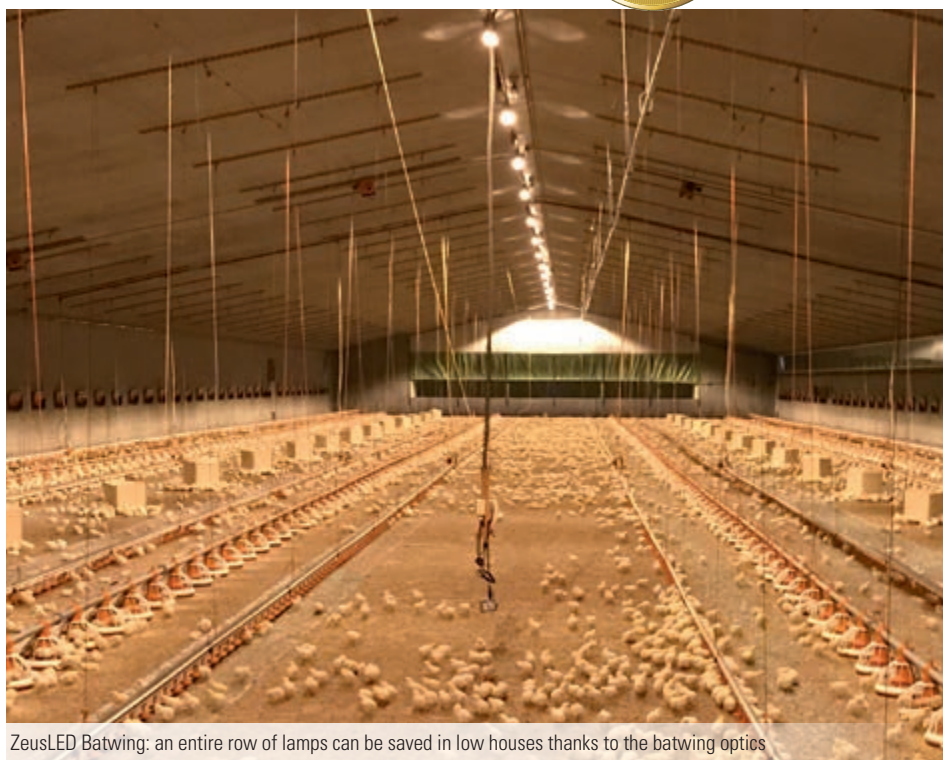
The main characteristic of our ZeusLED Batwing is its special batwing optics. The lamp has the following advantages:

- ✓ emits light in a wide range: the beam angle is 141°;
- ✓ has a 30 percent higher light output compared to the standard ZeusLED lamp;
- ✓ distributes light very evenly.

These advantages make ZeusLED Batwing a cost-efficient alternative for broiler houses with a low ceiling. In contrast to ZeusLED, it is only available with one colour temperature of either 3000 K or 5000 K.



ZeusLED Batwing with just 20 special LEDs per lamp



ZeusLED Batwing: an entire row of lamps can be saved in low houses thanks to the batwing optics

ZeusLED Wieland

Connectorized LED lamp, easy to assemble on site

With ZeusLED Wieland, you purchase an entirely pluggable solution that will save you time and money during installation.

Adjustments for the conditions on site are also easily possible. In the future, ZeusLED Wieland will also be available as a 2-channel lamp (warm white / red). This will make the lamp a good option not only for broiler houses, but also for layers.



ZeusLED Wieland: easy to assemble on site

Important advantages of ZeusLED Wieland

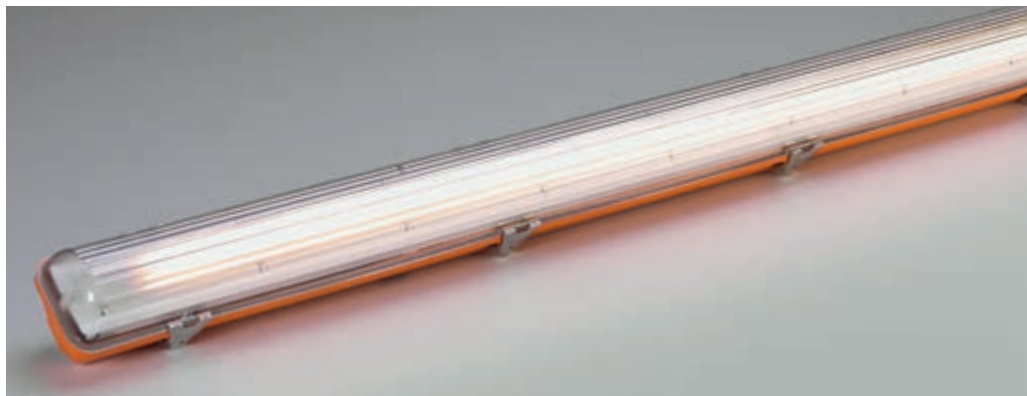
- ✓ fast, easy and safe installation: up to 80 percent of time savings and up to 15 percent of cost savings thanks to the plug & play principle;
- ✓ high functional reliability, no incorrect plugging possible;
- ✓ modular design: subsequent extensions and modifications and the replacement of individual lamps at any time are no problem;
- ✓ no need to open the lamp for function checks and installation;
- ✓ protection against accidental disconnection: high operational reliability;
- ✓ plug connections protected against contact;
- ✓ no experts required for installation;
- ✓ resistant to high-pressure cleaning, IP 69K protection rating.

Moisture-proof LED lamp

Energy-saving and dimmable, also available as LED retrofit kit

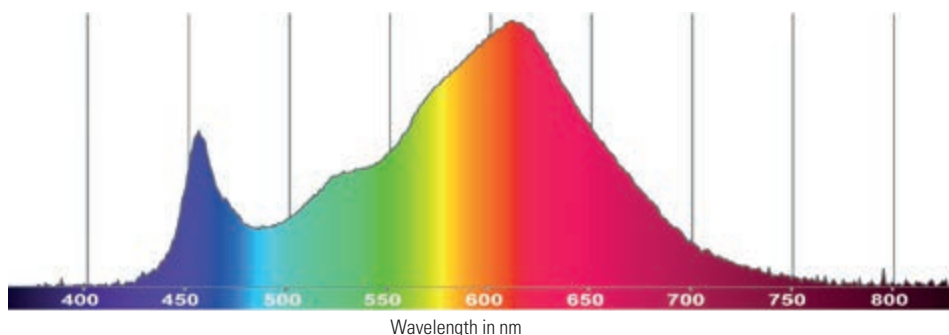
Our new moisture-proof LED lamp is a damp-proof luminaire which not only saves energy and has a long service life, but which also allows infinitely variable dimming from 1 to 100 percent.

With our new LED retrofit kit, we can moreover provide you with the unique option of turning your old moisture-proof lamps into innovative LED illumination in next to no time.



Moisture-proof LED lamp with exchangeable LED board

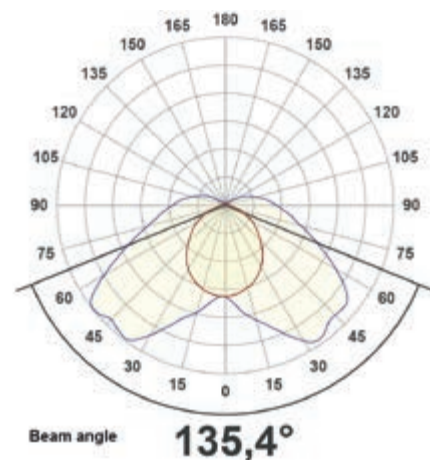
Light spectrum



Beam angle

The beam angle of 135° is similar to that of conventional moisture-proof lamps.

- ① Longitudinal installation
- ② Crosswise installation



Important advantages of our moisture-proof LED lamp

- ✓ low power consumption: energy costs reduced by up to 50 percent compared to conventional moisture-proof lamps;
- ✓ zero flickering;
- ✓ infinitely variable dimming from 1 to 100 percent thanks to integrated control gears;
- ✓ perfect light distribution because of a new V-shape;
- ✓ resistant to ammonia;
- ✓ no control cabinet conversion necessary;
- ✓ protection rating IP 65;
- ✓ long service life of up to 50,000 hours;
- ✓ a clever LED retrofit kit fits most conventional moisture-proof lamps;
- ✓ no new cabling required when replacing the old moisture-proof lamps due to identical five-core cables;
- ✓ available in two lengths: 1275 and 1575 mm;
- ✓ closing clips made of stainless steel;
- ✓ attractive price : performance ratio.

HELIOS

The versatile LED panel light

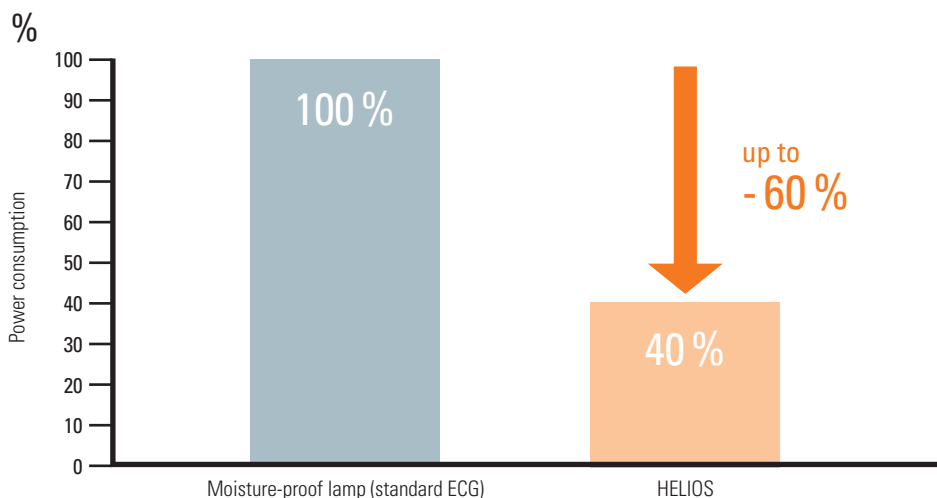
Good illumination of the barn is an important factor for success. The robust LED panel light HELIOS evenly illuminates all areas of your barn. Energy savings of up to 60 percent compared to conventional moisture-proof lamps are an unbeatable advantage. HELIOS is well-suited for use in livestock houses because it is resistant to ammonia. A replacement also makes sense in service rooms where old lighting technology is still installed. Another perfect application for HELIOS is its use in a winter garden.



BIG DUTCHMAN HELIOS
 ✓ Ammonia resistance
 ✓ Cleaning distance
 DLG test report 6982



Energy savings



ECG = electronic control gears

Main advantages

- ✓ LED technology for long-lasting energy savings of up to 60 percent;
- ✓ robust housing made of aluminium;
- ✓ zero flickering;
- ✓ lens optics for even light distribution;
- ✓ resistant to ammonia;
- ✓ voltage range 110–240 VAC, 50/60 Hz;
- ✓ replacement of LED driver and LED board possible due to modular design;
- ✓ long service life of 50,000 hours, low maintenance requirements;
- ✓ resistant to high-pressure cleaning, IP 69K protection rating;
- ✓ optimised price : performance ratio;
- ✓ cable already attached for reduced assembly costs.



Even and energy-saving illumination of the winter garden, especially in the dark season of the year

Light control 103

Professional, modular system ideal for customisation!

The Big Dutchman light control 103 is used for automatic light regulation of any type of lamp. It is equipped with a 3.5-inch touch screen and can control up to twelve light scenes. These scenes (e.g. sunrise and sunset) can be configured individually for nine light groups (nine houses). Additionally, four outside and sixteen inside sensors can be connected.

The housing has an IP 54 protection rating and is thus protected against water. The light control can be retrofitted easily as a stand-alone version, even for non-BD lighting systems. Customised lighting programs can be saved via an integrated USB interface and also be transferred easily to other light controls (copy & paste).

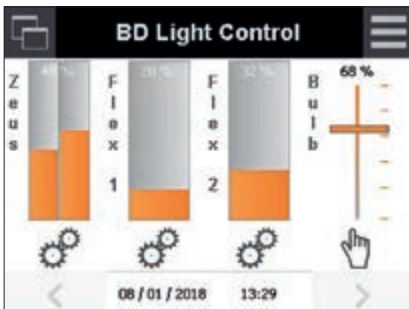
In addition to the stand-alone version, we also have a unit for installation in the control cabinet on offer.



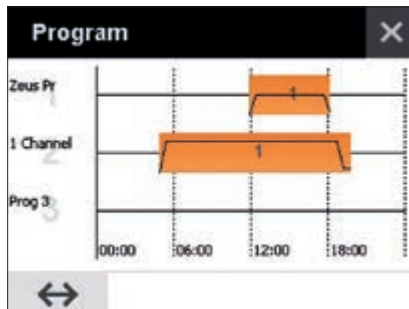
Simulation of sunset and sunrise

Important functions

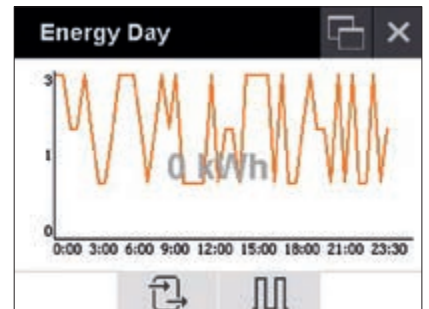
- ✓ **light programs can be customised** based on light curves that are set up individually beforehand;
- ✓ **simulation of sunrise and sunset** using brightness and colour temperature;
- ✓ **light level during the inspection rounds:** a special light that can be turned on at the touch of a button. After a defined time, the light control automatically returns to the normal lighting program;
- ✓ **recording of energy consumption:** a conventional electricity meter can be connected to the light control via digital input;
- ✓ additionally, connection of up to **nine time switches** is possible.



Main menu of the light control



Example of a lighting program



Recording of the daily energy consumption

Overview of the technical data of our LED lamps

		FlexLED	FlexLED HO	FlexLED 2-channel	FlexLED bulb	FlexLED eco	FlexLED glo
Areas of use		<i>in the bird area</i>	<i>in the bird area and for ceiling and wall lighting</i>	<i>in the bird area</i>	<i>in the aisle</i>	<i>in the bird area</i>	<i>in the feed pan</i>
Supply voltage	V, Hz	48 VDC	48 VDC	48 VDC	48 VDC	48 VDC	48 VDC
Power	W	5.5–6	4.1–16.4	6.7	6.3	2	1
Light output	lm	300–450	450–1800	500	650	130–190	100
Efficiency	lm/W	75	110	74	103	95	100
Frequency	Hz	2000	2000	> 500	2000	2000	2000
Colour temperature	K	3000	3000	3000	3000	3000	3000
Beam angle	°	110	110	110	151	110–150	360
Dimming	%	✓ 0–100	✓ 0–100	✓ 0–100	✓ 0–100	✓ 0–100	✓ 0–100
Zero flickering		✓	✓	✓	✓	✓	✓
Number of LEDs	quantity	8–14	12–48	8–14	7	14	14
Protection rating	IP	69 K	69 K	69 K	69 K	69 K	67
Service life	hours	50 000	50 000	50 000	50 000	50 000	50 000
Temperature range	°C	-10 to +50	-10 to +50	-10 to +50	-10 to +40	-10 to +40	-10 to +40
Certification		CE, UL	CE, UL	CE	CE	CE	CE, UL
Height / width / length	mm	11 x 22 x 1130-2230	11 x 22 x 450-1800	11 x 22 x 1800	70 x 70 x 100	16 x 16 x 60	12 x 12
Weight	kg	0.25–0.35	0.25–0.35	0.28	0.12	0.015	0.10
Material		PMMA*	PMMA*	PMMA*	PMMA*	PMMA*	Silicone

		ZeusLED	ZeusLED Batwing	ZeusLED Wieland	Moisture-proof LED lamp	HELIOS
Areas of use		<i>for ceiling and wall lighting</i>	<i>for ceiling and wall lighting</i>	<i>for ceiling and wall lighting</i>	<i>for ceiling and wall lighting</i>	<i>for ceiling and wall lighting</i>
Supply voltage	V, Hz	100–240 VAC 50/60 Hz	100–240 VAC 50/60 Hz	100–240 VAC 50/60 Hz	100–240 VAC 50 Hz	100–240 VAC 50/60 Hz
Power	W	32.5	47	32.5	27–36	45
Light output	lm	4100	5200	4100	2900–3700	5100
Efficiency	lm/W	127	110	127	107–103	134
Frequency	Hz	16000	16000	16000		
Colour temperature	K	2700–5000	3000/5000	3000/5000	2800	4000
Beam angle	°	105–140	141	140	135	120
Dimming	%	✓ 0–100	✓ 0–100	✓ 0–100	✓ 1–100	no
Zero flickering		✓	✓	✓	✓	✓
Number of LEDs	quantity	112	20	112	96	14
Protection rating	IP	69 K	69 K	69 K	65	69 K
Service life	hours	> 50 000	50 000	50 000	50 000	> 50 000
Temperature range	°C	-20 to +50	-20 to +45	-20 to +50	-20 to +35	-20 to +40
Certification		CE, UL	CE	CE	CE	CE
Height / width / length	mm	438.5 x 121.5 x 82.5	438.5 x 112 x 82.5	438 x 121 x 82.5	110 x 110 x 1274/1574	383.5 x 84 x 69
Weight	kg	2	2	2	2.5	2
Material		Aluminium, PMMA*	Aluminium, PMMA*	Aluminium, PMMA*	Aluminium, ABS	Aluminium, PMMA*

* PMMA = polymethyl methacrylate



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